

Middle plateau.—From 25° at Salt Lake City, on the 17th, to 32° at Pioche, Nevada, on the 19th.

Northern plateau.—From 32° at Lewiston, Idaho, on the 17th, and at Dayton, Washington Territory, on the 22d, to 37° at Eagle Rock, Idaho, on the 3d and 23d, and at Fort Missoula, Montana, on the 17th.

North Pacific.—From 31° at Olympia, Washington Territory, on the 12th and 20th, to 42° at Roseburg, Oregon, on the 21st.

Middle Pacific.—From 20° at San Francisco, California, on the 1st, to 36° at Red Bluff, California, on the 3d.

South Pacific.—From 18° at San Diego, California, on the 1st, to 37° at Visalia, California, on the 1st.

The following are reports of remarkably sudden changes in temperature:—

Fallston, Maryland, 7th.—The temperature fell 28° from 2 to 7 p. m. on this date.

Quincy, Illinois, 18th.—The temperature fell from 70° at 3 p. m. to 30° at 6 p. m., a change of 40° in three hours.

Lincoln, Illinois, 18th.—A very remarkable change in temperature occurred here during the afternoon of this date.

Swanwick, Illinois, 18th.—The temperature fell from 73° at 2 p. m. to 31° at 9 p. m., a fall of 42° in seven hours, and at 7 a. m. of the 19th it had fallen to 21° giving a range of 52° for seventeen hours.

Mattoon, Illinois, 18th.—At 3 p. m. the temperature was 75° and at 6 p. m. 29°, a fall of 46° in three hours. This sudden change occurred during the prevalence of a strong north wind.

Springfield, Illinois, 18th.—The temperature fell 38° between 3.30 and 4 p. m., and during the seven hours ending at 10 p. m. it fell 50°.5, from 73° to 22°.5.

Logansport, Indiana.—From 1.30 p. m. of the 18th to 6 a. m. of the 19th, sixteen and one-half hours, the temperature fell 53°.

Saint Louis, Missouri, 18th.—The temperature fell from 78° at noon to 29° at 10.07 p. m., being a fall of 49°.

Green Springs, Alabama, 19th.—At 2 p. m. of this date, the thermometer read 77°, and during the succeeding fifteen hours the temperature fell 47°.

Huron, Dakota.—The maximum temperature of the 17th was 70°.5; minimum of the 18th,—7°.8.

Ithaca, New York, 18th.—Temperature fell from 63° at 2 p. m., to 31° at 9 p. m.

North Lewisburg, Ohio, 18th.—Temperature fell 25° in less than one hour.

FROSTS.

In the various districts they were reported on the following dates:—

New England.—1st to 31st.

Middle Atlantic states.—1st to 31st.

South Atlantic states.—1st to 4th, 8th to 13th, 16th to 27th.

Florida peninsula.—1st, 2d, 3d, 13th, 14th, 20th.

Eastern Gulf.—1st, 2d, 4th, 10th to 13th, 20th, 23d, 27th, 28th.

Western Gulf.—1st, 3d, 4th, 7th, 8th, 9th, 11th, 12th, 13th, 16th to 20th, 22d, 27th.

Rio Grande valley.—9th, 20th.

Ohio valley.—1st, 3d to 12th, 14th, 16th, 17th 19th to 24th, 30th, 31st.

Tennessee.—1st to 4th, 7th to 14th, 16th to 22d, 24th, 27th.

Lower lakes.—1st to 31st.

Upper lakes.—1st to 31st.

Extreme northwest.—1st to 31st.

Upper Mississippi valley.—1st to 31st.

Missouri valley.—1st to 4th, 6th to 13th, 15th, 16th, 17th, 20th, 22d, 23d, 27th, 29th, 30th.

Northern slope.—1st to 31st.

Middle slope.—1st to 5th, 7th to 12th, 15th, 16th, 18th, 20th to 31st.

Southern slope.—7th, 8th, 16th, 19th, 20th.

Southern plateau.—1st to 20th, 23d, 25th, 30th, 31st.

Middle plateau.—1st to 21st, 24th, 29th, 30th, 31st.

Northern plateau.—1st to 18th, 26th, 27th, 31st.

North Pacific.—3d, 4th, 6th, 13th.

Frosts occurred at Sacramento, California, 10th, 16th, 19th, 31st.

The following instances of injury to vegetation by frosts have been reported:

Augusta, Georgia, 18th.—The farmers in this vicinity report that the recent frosts have done great injury to fruit-trees and garden vegetables.

Knoxville, Tennessee, 22d.—The snow storm of the night of the 21st and the freeze of this date are reported to have been injurious to the fruit-trees in this locality.

Grand Haven, Michigan, 19th.—It is feared that the peach-trees throughout this section have been killed by the recent cold weather.

At Charlotte, North Carolina, damaging frosts occurred on the 25th, 26th and 27th.

ICE.

The subject of the formation of ice in the northern sections is considered elsewhere in the REVIEW under the heading "Ice in Rivers and Harbors." The following instances of its formation in the southern states, have been reported:

Alabama.—Auburn, 12th, 16th, 19th.

Florida.—Jacksonville, 13th.

Georgia.—Atlanta, 12th, 13th, 16th, 20th; Augusta, 13th; Forsyth, 12th, 13th, 16th, 22d, 23d.

North Carolina.—Wilmington, 23d.

South Carolina.—Stateburg, 12th, 13th.

Texas.—Fort Concho, 19th.

PRECIPITATION.

[Expressed in inches.]

The distribution of rainfall over the United States and Canada, as determined from observations taken at more than five hundred stations, is exhibited on chart iv.

In the first column of the following table is given the average March rainfall in the various districts for several years; in the second column is given the average for March, 1883; and the third column shows the excess or deficiency of March, 1883, as compared with the average of previous years:

Average precipitation for March, 1883.

Districts.	Average for March. Signal-Service observa- tions.		Comparison of Mar., 1883, with the average for several years.
	For several years.	For 1883.	
	Inches.	Inches.	Inches.
New England.....	5.19	2.57	2.62 deficiency.
Middle Atlantic states.....	4.42	2.91	1.51 deficiency.
South Atlantic states.....	5.19	5.58	0.39 excess.
Florida peninsula.....	2.75	4.10	1.35 excess.
Eastern Gulf.....	5.04	3.99	1.05 deficiency.
Western Gulf.....	3.65	4.24	0.59 excess.
Rio Grande valley.....	1.18	2.88	1.70 excess.
Tennessee.....	5.98	4.33	1.65 deficiency.
Ohio valley.....	3.98	3.12	0.86 deficiency.
Lower lakes.....	2.95	1.60	1.35 deficiency.
Upper lakes.....	2.57	0.72	1.85 deficiency.
Extreme northwest.....	1.28	0.47	0.81 deficiency.
Upper Mississippi valley.....	2.58	0.90	1.68 deficiency.
Missouri valley.....	1.54	0.91	0.63 deficiency.
Northern slope.....	0.45	0.82	0.37 excess.
Middle slope.....	0.37	0.12	0.25 deficiency.
Southern slope.....	0.84	2.43	1.59 excess.
Northern plateau.....	1.04	1.87	0.83 excess.
Middle plateau.....	1.17	1.17	normal.
Southern plateau.....	0.58	1.29	0.71 excess.
North Pacific.....	6.22	3.71	2.51 deficiency.
Middle Pacific.....	2.96	3.10	0.14 excess.
South Pacific.....	0.86	1.44	0.58 excess.
Mount Washington, N. H.....	7.22	4.18	3.04 deficiency.
Pike's Peak, Colo.....	2.33	0.61	1.72 deficiency.

There has been a deficiency in the monthly rainfall over a large extent of country from the New England and middle Atlantic coasts westward to the Missouri river, and also in the east Gulf states, the middle slope, and on the north Pacific coast. In the districts east of the Mississippi river (embraced in the area of deficiency) the departures vary from 0.86 in the Ohio valley to 2.62 in New England, and they average about 1.65.

Table of Excessive, Greatest, and Least Monthly Rainfalls.

STATION.	SPECIALLY HEAVY.			Largest Monthly Amount.	SMALLEST MONTHLY.	
	Date.	Amt.	Duration		STATION.	Amt.
<i>Alabama.</i>					<i>Arizona.</i>	
Mobile.....	7, 8	2.39			Casa Grande.....	0.00
Mount Vernon Barracks.....	24, 25	2.05			Maricopa.....	0.00
<i>Arizona.</i>					Yuma.....	0.00
Fort Bowie.....	2, 3	2.04			Texas Hill.....	0.20
<i>California.</i>					<i>California.</i>	
Emigrant Gap.....				10.06	Mammoth Tank.....	0.00
Oisco.....				9.25	Mojave.....	0.00
Alta.....				9.06	Fort Yuma.....	0.00
Colfax.....				7.98	Indio.....	0.11
Summit.....				7.50	San Diego.....	0.41
Angel Island.....	26, 27	2.30			<i>Colorado.</i>	
Sacramento.....	26, 27	2.28			West Las Animas.....	0.15
Red Bluff.....	26, 27	2.22			Colorado Springs.....	0.17
Los Angeles.....	28, 29	2.10			Denver.....	0.21
San Francisco.....	26, 27	2.03			Fort Garland.....	0.50
Visalia.....	27, 28	1.52			<i>Dakota.</i>	
<i>Florida.</i>					Fort Sisseton.....	0.05
Punta Rassa.....	20	3.41		6.64	Fort Yates.....	0.14
Jacksonville.....	25	2.34			Fort Totten.....	0.19
Mayport.....	25	2.00			Tobacco Garden.....	0.19
Saint Augustine.....	24, 25	2.00			Rapid City.....	0.35
<i>Indiana.</i>					Bismarck.....	0.38
New Albany.....	29, 30	2.07			Huron.....	0.42
Worthington.....	29, 30	2.06			Fort Pembina.....	0.50
Hanover.....	30	2.00			<i>Idaho.</i>	
<i>Kansas.</i>					Eagle Rock.....	0.40
Pretty Prairie.....	24	2.73			<i>Illinois.</i>	
<i>Louisiana.</i>					Chicago.....	0.42
New Orleans.....	24	2.60			<i>Iowa.</i>	
Do.....	7, 8	2.29			Independence.....	0.20
Shreveport.....	24	2.37			Indianola.....	0.28
Port Eads.....	8, 9	2.03			North Springs.....	0.30
<i>Maryland.</i>					Guttenburg.....	0.31
Woodstock.....	30	2.70			Ames.....	0.32
<i>New Jersey.</i>					Dubnque.....	0.32
Cape May.....	10	2.45			Cresco.....	0.33
<i>North Carolina.</i>					Humboldt.....	0.43
Portsmouth.....	26, 27	6.55		10.30	<i>Kansas.</i>	
Hatteras.....	26	3.55		7.00	Salina.....	0.03
Chapel Hill.....	9	2.20		6.91	Ossawatimie.....	0.25
Do.....	26	3.74			Holton.....	0.38
Charlotte.....	25, 26	3.70		6.54	<i>Michigan.</i>	
Kittyhawk.....	26	2.03		6.28	Fort Brady.....	0.30
Smithville.....	25, 26	2.90		6.13	Escanaba.....	0.33
Fort Mason.....	26	2.88			Lansing.....	0.34
<i>Ohio.</i>					Kalamazoo.....	0.42
Marietta.....	19, 20	2.75			Coldwater.....	0.45
Cincinnati.....	29, 30	2.00			<i>Minnesota.</i>	
<i>Oregon.</i>					Saint Paul.....	0.06
Portland.....	26, 27, 28	5.29		6.40	Fort Snelling.....	0.07
Albany.....	26	2.47			Saint Vincent.....	0.11
<i>Tennessee.</i>					Minneapolis.....	0.32
Knoxville.....	30	2.06			Duluth.....	0.38
<i>Texas.</i>					Moorhead.....	0.38
New Ulm.....	24	6.12	9 h. 30 m.	13.13	<i>Montana.</i>	
Do.....	15	2.75			Glendive.....	0.09
Do.....	7	2.28			Fort Keogh.....	0.39
Eagle Pass.....	12, 13	4.18			<i>Nebraska.</i>	
Denison.....	24	2.47			Red Willow.....	0.02
Palestine.....	24	2.27			Crete.....	0.10
Indianola.....	13	2.24	3 h. 44 m.		Table Rock.....	0.10
Coleman City.....	13	2.13			Milford.....	0.13
					Utica.....	0.15
					Fort Niobrara.....	0.24
					Inavale.....	0.25
					Stockham.....	0.30
					North Platte.....	0.47
					Perru.....	0.50
					<i>Nevada.</i>	
					Otero.....	0.00
					Palisade.....	0.00
					Elko.....	0.07
					Reno.....	0.15
					Goconda.....	0.29
					Beowawe.....	0.32
					Wadsworth.....	0.35
					Hot Springs.....	0.45
					<i>New Mexico.</i>	
					Lordsburg.....	0.00
					Santa Fe.....	0.40
					<i>New York.</i>	
					Fort Hamilton.....	0.20
					<i>Ohio.</i>	
					Margaretta.....	0.44
					<i>Texas.</i>	
					Fort Elliott.....	0.04
					Rio Grande City.....	0.44
					<i>Utah.</i>	
					Blue Creek.....	0.02
					Terrace.....	0.18
					Kelton.....	0.20
					<i>Wisconsin.</i>	
					La Crosse.....	0.13
					Milwaukee.....	0.28
					Madison.....	0.32
					<i>Wyoming.</i>	
					Fort Washakie.....	0.35
					Cheyenne.....	0.85

In the south Atlantic states, Florida, the west Gulf states, northern and southern slopes, and west of the Rocky mountains, the monthly rainfall is in excess of the March average. In Florida, the Rio Grande valley, and southern slope, the depart-

ures average about 1.55; in the south Atlantic states, northern slope, and the districts west of the Rocky mountains, the departures average about 0.50. On the summits of Mount Washington, New Hampshire, and Pike's Peak, Colorado, the monthly rainfalls are 3.04 and 1.72 below the average, respectively.

The following figures show the rainfall for the districts on the Pacific coast for the past four months, from December, 1882 to March, 1883, both inclusive, and the departures of each month from the averages—the plus and minus signs denoting above and below the average respectively.

Districts.	Average of season, Dec. to Mch., several years.	For season, Dec. to Mch., 1882-3.	Departure.	Departures of the respective months.			
				Dec., 1882.	Jan., 1883.	Feb., 1883.	Mch., 1883.
North Pacific.....	28.03	26.26	- 1.77	+6.87	-0.73	-5.40	-2.51
Middle Pacific.....	19.09	7.15	-11.94	-4.14	-4.14	-3.80	+0.14
South Pacific.....	6.76	3.87	- 2.89	-1.44	-1.38	-0.65	+0.58

It will be seen from the above statement that there has been a large deficiency in the rainfall in California during December, January and February, and also in the north Pacific coast region during January, February and March.

The rainfall of March, 1883, has been above the average in California, but on the north Pacific coast there has been a deficiency of 2.51, although at Portland, Oregon, the rainfall was but slightly below the March average.

The rains of the latter part of the month terminated the serious drought which prevailed in California, and were sufficient to assure the success of the wheat crop, and to greatly improve the pasturage of that State.

The following table has been prepared to show the districts of maximum departures from the average rainfall, with brief remarks upon its distribution, for the month of March, since 1874. The plus (+) and minus (-) signs denote above and below the average, respectively:

Year.	Districts.	Excess or deficiency.	Remarks.
1874.....	Gulf states.....		Deficient along the Atlantic coast and in the lower lakes; largely in excess in the Gulf states, and slightly excessive in the Missouri valley; normal in upper Mississippi valley, upper lakes, and Saint Lawrence valley.
1875.....	Tennessee.....	+ 5.76	Excessive in the middle and south Atlantic states, the Gulf states, and from Tennessee to the upper lakes; deficient in the Saint Lawrence valley and lower lakes.
	South Atlantic states.....	+ 2.34	
	Saint Lawrence valley.....	- 0.94	
1876.....	Western Gulf.....	+ 5.05	Excessive in all districts, except normal in Minnesota, and small deficiency in south Atlantic states.
	New England.....	+ 3.90	
	Middle Atlantic states.....	+ 2.85	
1877.....	Pacific coast region.....	+ 2.55	Excessive in all districts east of the Rocky mountains, except slight deficiencies in the western Gulf, upper Missouri valley, and in Minnesota.
	South Atlantic states.....	- 0.80	
	Saint Lawrence valley.....	+ 2.75	
1878.....	New England.....	+ 4.30	Slightly excessive over all the northern districts from New England to the Pacific, and deficient in the southern districts.
	Western Gulf.....	- 0.70	
	South Atlantic states.....	- 2.57	
1879.....	Eastern Gulf.....	+ 1.36	Below the average in all districts, except on the Pacific coast and in New England.
	Lower lakes.....	+ 1.25	
	New England.....	+ 1.10	
1880.....	California coast.....	+ 2.32	Excessive in the lake region, eastern Gulf, New England and middle Atlantic states, and south Pacific coast region; below the average in all other districts.
	Portland, Oregon.....	+ 3.44	
	Eastern Gulf.....	+ 3.82	
1881.....	Western Gulf.....	- 3.25	Deficient along the Gulf coast, in New England, middle states, Missouri valley, north Pacific coast, and at Rocky mountain stations; excessive in the lake region, Tennessee, the Ohio and upper Mississippi valleys, the extreme northwest, and south Atlantic states.
	South Atlantic states.....	- 2.05	
	Eastern Gulf.....	+ 3.32	
1882.....	Tennessee.....	+ 2.30	
	North Pacific coast.....	- 2.20	
	Middle Pacific.....	- 1.51	
	New England.....	- 1.89	
	North Pacific coast.....	- 4.84	
	Middle Pacific coast.....	- 2.46	
	Western Gulf.....	- 2.55	
	New England.....	+ 1.67	
	Upper lakes.....	+ 0.98	
	Ohio valley.....	+ 1.64	
	Tennessee.....	+ 1.13	
	Florida.....	- 2.10	
	Eastern Gulf.....	- 2.12	
	North Pacific coast.....	- 4.37	

DEVIATIONS FROM AVERAGE PRECIPITATION.

The departures exhibited by the reports from the regular Signal-Service stations are shown in the table of average precipitation. The Chief Signal Officer is indebted to voluntary observers for the following notes upon this subject. As some of these comparisons are made with the averages determined from records covering periods extending back many years before the establishment of the Signal Service, they will be found of special interest:—

Illinois.—Anna: monthly rainfall 3.93, or 0.27 below the March average of seven years.

Morrison: monthly rainfall 0.86, or 2.23 below the March average of last nine years. The largest March rainfall of that period, 8.09, occurred in 1876; the smallest is that of 1883.

Indiana.—Wabash: monthly rainfall 1.21, or 2.02 below the March average of six years.

Kansas.—Yates Centre: monthly rainfall 0.58, or 1.05 below the March average of three years. Wellington, monthly rainfall 1.14, or 0.14 below the March average of four years. Lawrence, monthly rainfall 1.28, or 0.96 below the average of fifteen years. During that period the largest March rainfall, 4.51, occurred in 1876; the smallest, 1.15, occurred in 1869.

Maine.—Gardiner: monthly rainfall, 2.24, is 1.67 below the March average of forty-seven years. The amount of rainfall for January, February and March, 1883, is 7.62, or 5.87 below the average of the corresponding months of forty-seven years.

Maryland.—Fallston: monthly rainfall, 3.23, is 1.15 below the March average of thirteen years. The largest March rainfall of that period, 8.75, occurred in 1876; the smallest, 1.79, in 1874.

Massachusetts.—Worcester: monthly rainfall, 1.91, is 1.61 below the March average. The rainfall for the three months

ending March 31st is 9.30, or 1.25 below the average of the corresponding months. The amount of snowfall, 10.25 inches, is about the average of March.

New Hampshire.—Grafton: monthly rainfall, 2.07, is 0.88 below the March average of three years. Antrim: monthly rainfall 2.20, or 2.33 below the March average of ten years.

New Jersey.—South Orange: monthly rainfall, 1.77, is 2.10 below the March average of thirteen years.

New York.—Palermo: monthly rainfall, 1.20, is 1.90 below the March average of the last thirty years. The largest March rainfall of that period, 7.00, occurred in 1859; the smallest is that of 1883. The amount of snowfall, 10.5 inches, is four inches below the average of March. During March 1870, 37 inches of snow fell; in 1882 the amount was 2.5 inches, the extremes occurring in these years. North Volney: monthly rainfall, 2.15, is 1.01 below the March average of eleven years. The largest March rainfall of that period, 6.97, occurred in 1873; the smallest 2.00, occurred in 1879.

Texas.—New Ulm: monthly rainfall, 13.13, is 7.43 above the March average of eleven years. During that period the smallest March rainfall, 2.25, occurred in 1877; the largest is that of March, 1883.

Vermont.—Woodstock: monthly rainfall 2.08, or 1.09 below the March average of the last fourteen years. The largest March rainfall of that period, 6.71, occurred in 1876; the smallest, 1.28, occurred in 1874. The largest March snowfall of a period of twenty-two years, 41.55 inches, fell in 1873; the smallest, 5.05, fell in 1878.

The following table, furnished by Miss M. E. Wing, of Charlotte, Vermont, shows the rainfall of each month at that place, with the exception of April, 1880, since May, 1868, with the annual sums and monthly averages:

Month.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	Monthly means for the series.
January.....		1.00	2.00	1.60	0.70	4.60	2.50	1.50	1.70	2.20	1.80	2.30	1.60	2.50	0.90	1.92
February.....		4.10	4.80	2.00	2.40	1.40	1.50	1.70	3.20	0.20	1.30	1.40	1.40	1.20	1.70	2.02
March.....		5.30	2.10	5.50	1.20	4.30	1.40	2.70	3.30	3.80	1.20	2.50	1.10	1.90	2.40	2.76
April.....		3.50	3.30	0.10	0.00	1.40	3.70	1.50	1.40	2.20	2.40	3.30	0.60	0.60	1.00	2.38
May.....	7.40	0.30	0.70	2.90	3.00	1.20	3.70	3.00	1.40	0.60	1.70	0.50	1.40	2.60	2.40	2.60
June.....	3.30	6.10	6.90	3.00	3.30	2.40	3.70	3.00	1.70	2.80	1.40	2.50	1.40	1.60	3.20	3.06
July.....	3.20	3.80	3.30	9.00	5.00	3.90	0.40	2.10	2.10	6.00	2.50	2.20	1.40	2.70	2.20	3.73
August.....	1.00	4.60	3.30	6.30	9.40	2.40	1.30	1.70	2.60	2.30	5.00	1.70	1.10	2.80	1.90	3.16
September.....	4.40	3.90	3.30	2.90	4.00	1.70	3.30	4.90	1.20	0.00	1.70	3.00	2.90	2.40	7.50	3.19
October.....	1.90	11.40	5.70	5.00	4.20	6.00	1.00	3.90	5.00	3.50	3.50	0.70	4.00	1.40	1.10	3.89
November.....	8.90	1.50	2.50	3.30	3.20	3.30	2.70	3.00	0.60	2.90	2.70	4.00	2.30	1.00	3.00	2.99
December.....	1.90	4.20	1.80	2.00	2.10	1.80	0.50	0.90	1.40	1.10	4.00	1.40	1.00	2.10	2.90	1.94
Annual sums.....	32.00	55.70	40.00	49.60	39.10	34.40	32.30	30.10	25.60	28.20	29.30	24.50	19.60	22.70	30.20	33.98
Monthly means for each year.....	4.00	4.64	3.33	4.13	3.26	2.87	2.69	2.51	2.13	2.35	2.44	2.04	1.78	1.89	2.52	2.80

* Annual average of thirteen years.

† General monthly average.

Virginia.—Variety Mills: monthly rainfall, 3.04, is 0.53, below the average of the last four years. Wytheville: monthly rainfall, 4.41, is 1.41 in excess of the March average of a period of nineteen years.

West Virginia.—Helvetia: monthly rainfall, 5.37, is 0.31 above the March average of seven years.

The following table shows the greatest and least number of rainy (upon which rain fell) and cloudy days, the percentages of mean relative humidity, and the dew-point, as reported from the various districts:

HAIL.

Fort Concho, Texas, 15th.—Heavy thunder-storm accompanied by rain and hail; hailstones, measuring from one-half to three-fourths of an inch in diameter, fell from 12.18 to 12.33 p. m.

Uvalde, Texas, 23d.—A terrific hail storm, accompanied by rain and high north wind, occurred at 7.40 p. m. The hailstones were the size of hazel-nuts and did considerable damage to shrubbery and other vegetation. The storm was of about twenty minutes duration.

San Antonio, Texas.—During the night of the 23d a severe

wind and rain storm prevailed over western Texas, flooding the country and causing the streams to rise rapidly. In some sections very large hail-stones fell. Trees, fences and light buildings were blown down. The river at San Antonio rose to a higher point than has been known for many years.

Cairo, Illinois, 29th.—Hail-stones the size of peas fell here at about 10.30 p. m. Three miles west of station the storm was more severe, the hail-stones being as large as walnuts.

Litchfield, Illinois, 29th.—A heavy hail storm of short duration was experienced here during the afternoon.

Hail storms of less violence have been reported as follows:

Arizona.—Fort Bowie, 18th; Phoenix, 15th; Prescott, 13th, 23d.

California.—Sacramento, 30th; San Francisco, 30th; Cape Mendocino, 30th.

Connecticut.—Southington, 20th.

Idaho.—Fort Lapwai, 28th.

Georgia.—Atlanta, 25th.

Illinois.—Anna, 30th.

Indiana.—Lafayette, 14th.

Iowa.—Monticello, 5th.

Kansas.—Fort Scott, 21st, 22d, 29th, 30th; Salina, 31st.

Maryland.—Sandy Springs, 30th.
Massachusetts.—Cambridge, 18th, 22d.
Missouri.—Protem, 19th.
Nevada.—Pioche, 29th 30th, 31st; Fort McDermitt, 29th.
New York.—Factoryville, 19th.
North Carolina.—Brevard, 2d, 9th, 30th; Weldon, 3d, 26th;
 Ore Knob, 9th; Wilmington, 30th.
Ohio.—Bethel, 31st; College Hill, 19th; Jacksonburg, 19th.
Oregon.—Umatilla, 28th; Roseburg, 30th, 31st.
Pennsylvania.—Wellsboro', 19th; Fallsington, 30th; West
 Chester, 30th.
Texas.—Brackettsville, 23d; Jacksboro', 23d; Palestine, 24th.
Utah.—Coalville, 24th.
Virginia.—Marion, 15th; Wytheville, 30th.
Washington Territory.—Spokane Falls, 27th; Pomeroy, 28th.
West Virginia.—Morgantown, 14th.
Wyoming.—Fort Washakie, 30th.

Table of rainy and cloudy days, relative humidity and dew-point for
 March, 1883.

Districts.	Rainy days	Cloudy days	Rel. humidity. *	Dew-point
			Percentages.	°
New England.....	From 6 to 19	From 4 to 12	From 57.7 to 70.8	From 15.1 to 23.2
Middle Atlantic states..	" 7 " 14	" 3 " 11	" 50.8 " 74.6	" 16.6 " 31.9
South Atlantic states..	" 9 " 15	" 4 " 10	" 53.0 " 88.8	" 30.2 " 47.1
Florida peninsula.....	" 5 " 8	" 6 " 8	" 71.9 " 72.6	" 51.2 " 63.0
Eastern Gulf.....	" 6 " 18	" 6 " 12	" 58.9 " 71.1	" 39.7 " 48.6
Western Gulf.....	" 7 " 19	" 6 " 13	" 60.0 " 83.0	" 33.9 " 58.5
Rio Grande valley.....	" 2 " 13	" 9 " 11	" 67.9 " 81.2	" 51.5 " 60.7
Ohio valley and Tenn....	" 10 " 21	" 7 " 14	" 58.2 " 71.5	" 20.7 " 36.8
Lower lakes.....	" 8 " 21	" 8 " 13	" 55.9 " 78.6	" 17.0 " 23.0
Upper lakes.....	" 7 " 16	" 5 " 10	" 59.5 " 80.5	" 7.5 " 21.0
Extreme northwest.....	" 6 " 14	" 5 " 11	" 74.2 " 83.9	" 4.9 " 14.3
Upper Mississippi valley	" 6 " 16	" 5 " 12	" 57.8 " 83.8	" 14.2 " 33.5
Missouri valley.....	" 8 " 18	" 7 " 11	" 62.7 " 71.5	" 16.6 " 20.9
Northern slope.....	" 3 " 14	" 3 " 11	" 47.7 " 82.3	" 17.3 " 32.1
Middle slope.....	" 2 " 7	" 3 " 5	" 48.5 " 52.6	" 19.2 " 28.7
Southern slope.....	" 5 " 13	" 3 " 12	" 53.4 " 70.0	" 33.2 " 43.7
Southern plateau.....	" 2 " 13	" 2 " 10	" 46.5 " 68.2	" 23.8 " 42.8
Middle plateau.....	" 5 " 11	" 8 " 10	" 45.5 " 46.9	" 24.3 " 26.3
Northern plateau.....	" 5 " 11	" 1 " 10	" 45.5 " 72.8	" 24.3 " 36.2
North Pacific.....	" 8 " 10	" 8 " 10	" 69.1 " 80.9	" 40.1 " 41.5
Middle Pacific.....	" 5 " 8	" 4 " 15	" 59.9 " 84.3	" 42.2 " 47.1
South Pacific.....	" 2 " 11	" 3 " 13	" 56.0 " 80.2	" 42.6 " 50.3
Mt. Washington, N. H....	Sixteen	One	" 96.9	" 0.2 "
Pike's Peak, Col.....	Fourteen	Four	" 81.4	" 8.2 "

* Relative humidity corrected for altitude.

SNOW.

The dates on which snow is reported to have fallen in the various districts are as follows:—

New England.—2d to 15th, 17th to 21st, 23d to 28th, 30th, 31st.

Middle Atlantic states.—3d, 4th, 6th, 7th, 10th to 13th, 15th, 16th, 19th, 20th, 23d to 31st.

South Atlantic states.—8th, 21st, 22d, 23d, 25th.

Ohio valley.—1st, 3d to 7th, 9th, 10th, 11th, 15th, 16th, 17th, 19th to 31st.

Tennessee.—19th to 22d.

Lower lakes.—2d to 13th, 15th to 24th, 26th to 29th.

Upper lakes.—2d to 23d, 25th to 28th.

Extreme northwest.—1st to 6th, 8th to 11th, 14th to 22d, 24th to 27th, 29th, 30th, 31st.

Upper Mississippi valley.—2d, 5th, 6th, 9th, 11th, 15th, 16th, 18th to 30th.

Missouri valley.—2d, 5th, 6th, 9th, 10th, 14th, 15th, 18th to 31st.

Northern slope.—4th to 9th, 16th to 31st.

Middle slope.—1st, 3d, 4th, 5th, 12th to 16th, 18th, 19th, 21st, 24th to 31st.

Southern plateau.—3d, 4th, 12th, 15th, 18th, 19th, 23d, 30th, 31st.

Middle plateau.—3d, 4th, 13th, 14th, 15th, 18th, 24th, 29th, 30th, 31st.

Northern plateau.—25th to 31st.

Snow also fell in the following states not included in the districts named above:

Arkansas.—Fort Smith, 15th.

Texas.—Fort Davis, 7th.

The following are reports of heavy snow storms, causing interruption, to railway travel, etc.

Huron, Dakota, 2d.—The first through trains from the east since February 19th arrived on this date.

Humboldt, Iowa.—The Minneapolis and Saint Louis division of the Rock Island railroad was blockaded north of this station from the 6th to 8th.

Rochester, New York, 7th.—Eastern trains were delayed by snow-drifts.

Montreal, Quebec.—The snow storm of the night of the 6th–7th, was the heaviest of the season; the depth of snow in the streets was fully five feet. Reports from Toronto, Ontario, and other points state the storm was generally severe throughout Ontario, delaying travel on the various railroads.

Saint Paul, Minnesota, 9th.—The severest snow storm of the season is reported from points along the line of the Northern Pacific railroad. Freight business west of Fargo, Dakota, was entirely suspended and the passenger trains were run with great difficulty. At Grafton, Dakota, business was entirely suspended during the day.

Waterloo, Quebec.—A very severe snow storm prevailed during the 10th and 11th. The railroads were blockaded with snow, making all kinds of traffic impossible.

Toledo, Ohio, 18th.—Very heavy snow storm, causing suspension of street railway travel. Trains on the various railroads running into the city were delayed during the 18th and 19th. In the counties adjacent to Toledo, snow fell to a depth of fourteen inches.

Richmond, Vermont, 20th.—Very heavy snow storm; railroads blockaded and mails delayed.

East Tawas, Michigan.—The heaviest snow storm of the season occurred on the night of the 22d–23d, blockading the railroads and interrupting travel.

Toronto, Ontario.—A heavy snow storm prevailed throughout the provinces on the 23d. At Toronto snow fell to a depth of six inches, and was reported from other points to be from twelve to eighteen inches deep.

Fort Benton, Montana, 26th.—Severe snow storm; all coaches snow-bound and transportation delayed.

Ashland, Pennsylvania, 30th.—A heavy snow storm prevailed on this date throughout the Schuylkill, Northumberland, and Luzerne regions, and also in Berks, Lehigh, and adjoining counties. In the vicinity of Ashland the snow was nine inches deep, and from five to six inches throughout the eastern counties of the state.

LARGEST MONTHLY SNOWFALLS.

[Expressed in inches.]

The following are the largest monthly snowfalls reported from the various states and territories during the month:—

California.—Summit, 72; Cisco, 34; Emigrant Gap, 25; Fort Bidwell, 7.6; Alta, 4.

Colorado.—Fort Lewis, 10; Pike's Peak, 6.1.

Connecticut.—New London, about 15; Southington, 13; Bethel, 10.

Dakota.—Fort Randall, 23; Fort Meade, 20; Fort Hale, 12.1; Morrison, 11; Fort Buford, 9.1; Alexandria, 8.6; Fort Lincoln, 7; Fort Stevenson, 6.7; Fort Bennett, 6.4; Fort Sully, about 6; Fort Pembina, 5; Fort Garland, about 5.

Delaware.—Delaware Breakwater, 9.5.

District of Columbia.—Washington, about 8; West Washington, 7.

Illinois.—Riley, 10.75; Morrison, 7; Champaign, about 5.5; Rockford, 5.

Indiana.—Indianapolis, about 15; Lafayette, 7.5; Glenwood, 7; Wabash, 6.5; Fort Wayne, 5.5.

Iowa.—Logan, 10; Monticello, 6; Cedar Rapids, 5.8; Muscatine, 5; Des Moines, about 4.5; Nora Springs, 4.

Maine.—Eastport, about 22.5; Cornish, 18; Dexter, 12; Gardiner, 10; Orono, 7.5; Fort Preble, about 4.

Maryland.—Cumberland, 11; Fort McHenry, about 10; Sandy Springs, 9; Emmitsburg, 8.5; Fallston, about 8; Baltimore, about 6; Woodstock, about 6.

Massachusetts.—Rowe, 12; Princeton, 11.9; Somerset, 8.5;

Fall River, 7; Amherst, 6; Westborough, 5.75; Milton, 5; Mendon, 4.

Michigan.—East Tawas, 35; Port Huron, 28.6; Thornville, 17; Detroit, about 15; Traverse City, 14; Northport, 13.15; Mackinaw City, 12.5; Harrisonville, 12; Hillsdale, 99; Lansing, 8.75; Alpena, 66; Swartz Creek, 6.5; Marquette, 6.1; Coldwater, 4.5; Grand Haven, about 4.

Missouri.—Protem, 6.5; Jefferson Barracks, 4.

Montana.—Fort Missoula, 13.8; Billings, 11.3; Fort Assiniboine, 10; Fort Shaw, 8.5; Poplar River, 7.4; Helena, 7.3.

Nebraska.—Fremont, 7.25; Clear Creek, 6.75; Genoa, 6.2; De Soto, 5.75; Fort Niobrara, 4.8.

Nevada.—Truckee, 10; Boca, 7.

New Hampshire.—Mount Washington, about 40; Grafton, 18; Antrim, 13.

New Jersey.—Cape May, about 14; Caldwell, 11; Paterson, 11; South Orange, 10.25; Freehold, 9.4; Bordentown, 8.75; Cumberland, 8.5; Sandy Hook, about 8; Somerville, 6.5; Moorestown, 4.25; Vineland, 4.

New York.—Johnstown, 19; Friendship, 16.75; Plattsburg Barracks, about 16; Port Jervis, 15; Albany, about 15; Rochester, about 14; West Point, about 13; Kiantone, 12.75; Coopers-town, 12; Ithaca, 11.5; Fort Columbus, 11.2; New York City, about 11; Menand Station, (near Albany,) 10.75; Palermo, 10.50; White Plains, 10; Ardenia, 10; Hector, 9; Buffalo, 8.6; Flushing, 8; Fort Niagara, about 8; Madison Barracks, about 8; Oswego, about 8; Mountainville, 7.8; Factoryville, 6.9; Penn Yan, 6.9.

North Carolina.—Ore Knob, 13; Lenoir, 9; Brevard, 7; Highlands, 5; Chapel Hill, 4.25.

Ohio.—Canal Dover, 15; Jacksonburg, 13; North Lewisburg, 12; Ruggles, 12; Cleveland, 11.7; Columbus, about 8; Toledo, 6.5; Westerville, 6; College Hill, 4.75; Marion, 4.

Pennsylvania.—Catawissa, 20; Grampian Hills, 19; Dyberry, 18; Pittsburgh, about 18; Williamsport, 17.7; Chambersburg, 16.45; Wellsboro', 14.61; Erie, 12.5; Blooming Grove, 11.6; Meadville, 10; Fallsington, 9.15; West Chester, 8.75.

Rhode Island.—Newport, about 9.

Utah.—Fort Douglass, 5.

Vermont.—Newport, 45.25; Charlotte, 23; Lunenburg, 21; Strafford, 21; Woodstock, 19.

Virginia.—Wytheville, 15.5; Marion, 10; Accotink, 8.75.

West Virginia.—Helvetia, 8.25.

Wisconsin.—Franklin, 12; Manitowoc, 10.25; Beloit, 5.06; Embarrass, 4.5; Ripon, 3.78.

Wyoming.—Cheyenne, about 8; Fort Bridger, about 7.

DEPTH OF UNMELTED SNOW ON GROUND AT END OF MONTH.

[Expressed in inches.]

Colorado.—Pike's Peak, 6; Colorado Springs, 0.25.

Connecticut.—Bethel, 2; New Haven, 2; New London, 2; Southington, 2.

Dakota.—Fort Stevenson, 6; Alexandria, 4; Fort Bennett, 3; Morrison, 2; Bismarck, 1; Huron, trace; Yankton, trace.

District of Columbia.—Washington, 4.5; West Washington, 3.5.

Illinois.—Morrison, trace; Riley, trace.

Indiana.—Indianapolis, trace.

Iowa.—Cresco, in drifts; Humboldt, few drifts; Cedar Rapids, trace; Dubuque, trace; Guttenburg, trace; Monticello, trace; Nora Springs, trace.

Maine.—Gardiner, 22; Eastport, 5; Orono, 3; Portland, trace.

Maryland.—Sandy Springs, 2.5; Woodstock, 1; Fallston, trace; Emmittsburg, trace.

Massachusetts.—Rowe, 24; Fall River, 2; Somerset, about 2; Milton, 1.

Michigan.—Northport, 18; Traverse City, 18; Marquette, 6; East Tawas, 4; Mackinaw City, 4; Escanaba, 2.5; Alpena, trace; Grand Haven, trace; Hillsdale, trace; Port Huron, trace.

Minnesota.—Moorhead, 10; Saint Vincent, 2; Duluth, about 2; Northfield, in drifts; Saint Paul, trace.

Montana.—Fort Assiniboine, 10; Billings, 7; Helena, 6;

Benton, 5; Fort Keogh, 3; Fort Shaw, 3; Fort Missoula, 1; Poplar River, trace.

Nebraska.—Stockham, 1; North Platte, trace; Omaha, trace.

New Hampshire.—Mount Washington, 60; Grafton, 30.

New Jersey.—Freehold, 4; Paterson, 4; South Orange, 4; Sandy Hook, 3; Somerville, 3; Bordentown, 2; Cape May, trace.

New York.—North Volney, 28 in the woods, trace to drifts of 4 in the fields; Palermo, 18; Johnstown, 12; Mountainville, 7.8; Cooperstown, 6; Flushing, 2; Oswego, 1; Friendship, drifts in the woods; Ithaca, trace; Kiantone, trace; Rochester, trace; White Plains, trace.

Ohio.—Canal Dover, 4; Cleveland, trace; Marion, trace; Toledo, trace.

Pennsylvania.—Grampian Hills, 19; Dyberry, 2 to 24; Wellsboro', 4.2; Williamsport, 3; Fallsington, 2.5; Chambersburg, trace; Leetsdale, trace.

Rhode Island.—Newport, 1 to 2; Block Island, 1.5.

Utah.—Salt Lake City, trace.

Vermont.—Strafford, 30; Woodstock, 25; Newport, 3; Charlotte, 1 to 2.

Virginia.—Accotink, 5; Variety Mills, 0.75.

West Virginia.—Morgantown, 1.

Wisconsin.—Embarrass, 18 in forests, 8 in the fields; Ripon, 4; La Crosse, 2; Beloit, trace.

Wyoming.—Cheyenne, 0.25.

SNOW FROM A CLOUDLESS SKY.

Bismarck, Dakota, 8th.—At 9.30 p. m. light snow fell when the sky was entirely clear, with the exception of a low bank of clouds on the northern horizon.

Louisville, Kentucky, 10th.—Snow fell from a cloudless sky from 10.30 to 10.42 p. m.

SLEET.

California.—Fort Bidwell, 30th.

Dakota.—Fort Sully, 28th, 31st; Rapid City, 29th.

Georgia.—Augusta, 8th.

Illinois.—Cairo, 19th; Springfield, 5th, 18th, 19th.

Indiana.—Indianapolis, 22d; Logansport, 5th, 18th; Wabash, 18th.

Iowa.—Burlington, 6th; Davenport, 5th, 6th, 25th, 29th;

Guttenburg, 25th; Humboldt, 5th.

Kansas.—Creswell, 2d, 4th; Fort Scott, 21st; Ossawatimie, 27th, 28th; Yates Centre, 23d.

Kentucky.—Louisville, 19th.

Maine.—Eastport, 10th, 13th.

Maryland.—Emmittsburg, 10th.

Missouri.—Saint Louis, 19th.

Nebraska.—Omaha, 24th.

New Hampshire.—Mount Washington, 20th.

New Jersey.—Freehold, 6th, 30th.

New Mexico.—Santa Fé, 24th.

New York.—Albany, 19th, 20th; Kiantone, 19th; Oswego, 19th; West Point, 10th.

North Carolina.—Charlotte, 25th, 26th; Wilmington, 8th.

Ohio.—Cincinnati, 19th.

Pennsylvania.—Chambersburg, 30th; West Chester, 30th.

South Carolina.—Stateburg, 8th.

Tennessee.—Chattanooga, 24th, 25th; Nashville, 19th, 24th.

Texas.—Indianola, 13th.

Vermont.—Burlington, 18th, 19th, 29th.

Virginia.—Chincoteague, 20th, 31st; Lynchburg, 31st; Variety Mills, 9th, 28th, 30th.

Washington.—Spokane Falls, 28th.

WINDS.

The prevailing directions of the wind for the month of March, 1883, at the Signal Service stations, are shown on chart iii., by arrows flying with the wind. Over the northern and central parts of the country, the prevailing winds were generally from the northwest; in the Carolinas they were from the southwest, except at Kittyhawk and Hatteras where they were northeast;